

CLAIMS

Now, therefore, the following is claimed:

- 1 1. A system for measuring a distance between materials comprising:
2 a first material having a surface;
3 a second material having a surface, the surface of the second material being
4 separated from the surface of the first material by a gap; and
5 a slot disposed in the first material such that a slot surface is formed on the
6 first material, the distance between the surface of the first material and the slot surface
7 being a precisely known distance, such that when a cavity distance is measured
8 between the surface of the second material and the slot surface, a gap distance is
9 determined by subtracting the precisely known distance from the cavity distance.
- 1 2. The system of claim 1, further comprising a second slot disposed in the
2 second material such that a second slot surface is formed on the second material, the
3 distance between the surface of the second material and the second slot surface being
4 a precisely known second distance, such that when a cavity distance is measured
5 between the slot surface and the second slot surface, the gap distance is determined by
6 subtracting the precisely known distance and the precisely known second distance
7 from the cavity distance.
- 1 3. A method for measuring distance between two materials, the method
2 comprising the steps of:
3 measuring distance between a slot surface formed by a slot in a first material
4 and a surface on a second material, the first material having a surface such that the
5 distance between the slot surface and the surface of the first material is a precisely
6 known distance; and
7 subtracting from the measured distance the precisely known distance to
8 determine the distance between the first material and the second material.

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1 4. The method of claim 3, further comprising the step of measuring the
2 precisely known distance between the slot surface and the surface of the first material,
3 the step of measuring the precisely known distance completed before the step of
4 measuring distance between the slot surface formed by the slot in the first material and
5 the surface on the second material.

1 5. The method of claim 3, further comprising the step of measuring the
2 precisely known distance between the slot surface and the surface of the first material,
3 the step of measuring the precisely known distance concurrently with the step of
4 measuring distance between the slot surface formed by the slot in the first material and
5 the surface on the second material.

1 6. The method of claim 3, further comprising the steps of:
2 transmitting a light through the first material and onto the surface of the
3 second material; and
4 detecting reflected light from the slot surface and the surface of the second
5 material such that the measured distance is determined.

1 7. The method of claim 3, further comprising the step of forming the slot
2 in the first material.

1 8. The method of claim 3, further comprising the steps of:
2 measuring a distance between a second slot surface and the slot surface of the
3 first material, the second slot surface formed by a second slot in the second material
4 such that the distance between the second slot surface and the surface of the second
5 material is a second precisely known distance; and
6 subtracting from the measured distance the precisely known distance and the
7 precisely known second distance to determine the distance between the first material
8 and the second material.

1 9. The method of claim 8, further comprising the step of forming the
2 second slot in the second material.

1 10. The method of claim 8, further comprising the steps of:
2 transmitting a light through the first material and onto the second slot surface;
3 and
4 detecting reflected light from the slot surface and the second slot surface such
5 that the measured distance is determined.

1 11. The method of claim 10, further comprising the steps of:
2 forming a cavity by aligning the slot in the first material with the second slot
3 such that the cavity is formed by a gap between the first material and the second
4 material and by the alignment of the slot in the first material with the second slot;
5 transmitting light through the cavity to measure a cavity distance; and
6 determining a gap distance by subtracting from the cavity distance the
7 precisely known distance and the precisely known second distance.

1 12. The method of claim 3, further comprising the step of:
2 comparing the distance between the first material and the second material with
3 a predefined reference distance; and
4 determining an error distance corresponding to the compared distances.

1 13. The method of claim 12, further comprising the step of adjusting the
2 position of the first material such that the error distance is decreased to a specified
3 tolerance.

1 14. The method of claim 12, further comprising the step of adjusting the
2 position of the second material such that the error distance is decreased to a specified
3 tolerance.

1 15. A system for measuring distance between two materials, comprising:
2 means for measuring distance between a slot surface formed by a slot in a first
3 material and a surface on a second material, the first material having a surface such
4 that the distance between the slot surface and the surface of the first material is a
5 precisely known distance; and
6 means for subtracting from the measured distance the precisely known
7 distance to determine the distance between the first material and the second material.

1 16. The system of claim 15, further comprising:
2 means for transmitting a light through the first material and onto the surface of
3 the second material; and
4 means for detecting reflected light from the slot surface and the surface of the
5 second material such that the measured distance is determined.

1 17. The system of claim 15, further comprising:
2 means for measuring a distance between a second slot surface and the slot
3 surface of the first material, the second slot surface formed by a second slot in the
4 second material such that the distance between the second slot surface and the surface
5 of the second material is a second precisely known distance; and
6 means for subtracting from the measured distance the precisely known
7 distance and the precisely known second distance to determine the distance between
8 the first material and the second material.

1 18. The system of claim 17, further comprising:
2 means for transmitting a light through the first material and onto the second
3 slot surface; and
4 means for detecting reflected light from the slot surface and the second slot
5 surface such that the measured distance is determined.

- 1 19. The system of claim 18, further comprising:
2 means for forming a cavity by aligning the slot in the first material with the
3 second slot such that the cavity is formed by a gap between the first material and the
4 second material and by the alignment of the slot in the first material with the second
5 slot;
6 means for transmitting light through the cavity to measure a cavity distance;
7 and
8 means for determining a gap distance by subtracting from the cavity distance
9 the precisely known distance and the precisely known second distance.

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